REDUCE ROAD TRAFFIC POLLUTION TODAY by Improving VEHICLE CONDITIONS.

1. Vehicle's conditional monitoring is also one of the factors that can be considered to reduce this alarming road traffic pollution.
2. By improving, fine tuning and retrofitting to the existing vehicles, the pollution can be reduced now.

3. This brief idea is to how the source of traffic pollution can be first reduced instantly and immediately TODAY by all of us:-
4. by improving the vehicle air intake,
5. Lifting the Air Pre-filter relocation to a Height.
6. Reduction (by Routine cleaning) air intake filter pressure drop.

EXISTING VEHICLE AIR INTAKE CONDITIONS : -

1. Presently, vehicle engine sucks the hot air thro the air filter which is located near the exhaust fumes of same vehicle and that of other vehicles like the 3, and 4 wheelers, car, LCV, HCV, bus, & lorry that are plying in the same road nearby.
2. Heavily choked air intake filters of vehicles like the above, which is not condition monitored regularly.
3. **GOVT to implement Pollution Control Measures**:- The Govt to strictly prioritize the pollution agenda in improving vehicle conditions by the OEM, and in educating condition monitoring practices by vehicle users not only checking the Vehicle exhaust fumes, but as well Air intake filter conditions.
4. **One of the reasons for black smoke from vehicles is due to choked air intake fixed at the wrong bottom location now.**

- Image I – Autorickshaw, where the Pre-filter is elevated at the rear by piping to top, from Air Intake filter near Engine.
- Image II – Washable Pre-filter provided on top of Tractor Engine, the same to be fixed to Autos & other 4 wheelers.
- Image III- in HCV, the Pre-filter is elevated at 3 meter Height by piping from the existing air filter near the Engine.

1. PCRA illustrates that in the vehicles, “Air filter prevents dust from fouling the engine. Dust causes rapid wear of engine components and increases fuel consumption.

2. Cylinder bores wear out 45 times faster in engines without air-cleaners. Clean air filters at every tune-up. First step Today, is that each vehicle air intake filter to be cleaned thoroughly and where not possible, to replace the same immediately“.

3. The ideal norm of Stoichiometric Air / Fuel ratio gets deviated within few weeks of vehicle running on roads.
4. Because the road dust + outside hot exhaust air as air composition gets deposited in air intake filter.
5. Less volume of air consumed & more liters of fuel as diesel or petrol, will result in poor combustion & hence less KMPL quickly.

6. And the air has to pass thro this quickly-choking air filter. The automobile engine, as a matter of fact, any engine should not struggle to grab this contaminated hot air thro this choked filter. Cool Dry air to be delivered Freely at Air Filter Intake.
7. The vehicle OEM to recommend the vehicle owner to buy & install a washable Pre-filter with a suitable micron sized mesh, similar to the Tractor Air filter image, shown.
8. The owner to buy a spare washable nylon filter and weekly wash the nylon part of the filter with water and keep it ready for the week after next.
9. The time to wash the filter here is assumed as twelve run hours. So for buses, commercial vehicles, lorry etc, daily cleaning washable-nylon filter is a MUST.
10. Daily swapping with the washed & serviced nylon filter is recommended.

11. By this exercise, the existing air filter near engine does not get choked that frequently. The life of air filter is extended by the weekly washable nylon filter.

12. When the Tractor OEM and the Autorickshaw OEM has visualized this defect, and had relocated the air intake suction with their Pre-filter, why the other automobile Major OEM are not implementing this retrofit exercise to give healthy, fuel saving, & adequate clean air supply to their engines?

13. This practice can be followed by all the 2, 3 and 4 wheelers as this allows the engine to take only pre-filtered air to the main air intake filter of the engine

14. and it ensures engine runs smoothly & healthy thro out its life.

14. Coming to the main air intake filter, the choked air filter leads to poor combustion efficiency and higher polluted exhaust fumes.
15. Now the vehicle owners clean the filter only during their vehicle service at the garage after allowing choking during few months.
16. The 4 wheeler owner relies on the vacuum band gage near the air intake filter to show the pressure drop across the filter, and it always shows healthy clean band even when the filter is choked.
17. So the vehicle OEM to recommend to vehicle owners to fix air intake filter Delta P (choke) indicator by means of gauge either analog or digital. The choke indicates the pressure drop across the filter. This will be conditionally monitored by the vehicle owner.
18. Instead of allowing to build up the choke in filter for many months, pressure drop across filter can be maintained by weekly cleaning of pre-filter by owner routinely, by condition monitoring.

19. Similar to the heavy vehicles, for all the 3 and 4 wheelers, let the OEM recommend to the vehicle owner to extend the air intake pipe length from the main air intake filter to this pre-filter and keep this pre-filter at 1.5 meters elevation above the ground for autos, cars etc.
20. For lorry, bus, LCV and HCV the height can be 2 Meters and above. Also this air intake extension pipe to be sized double that of air intake filter mouth size.
21. By this, we are allowing the vehicle to consume relatively fresh air compared to the existing intake of exhausted polluted air from the other vehicles.
22. Care is taken to the pre-filter to provide Broader rain cap as we provide in all the DG sets exhaust, the rain cap. This Retrofit needs to be done in OEM authorized service center.

GOVERNMENT'S CARROT & STICK INITIATIVES REQUIRED :

1. Inside the vehicle, Govt can suggest the automobile OEM to provide air intake filter gauge so that the same can be condition monitored daily by the vehicle user.
2. Instead of allowing the air filter to choke for many months, he will take steps immediately, to clean his pre-filter daily right from the first day of using the new air intake filter.
3. Also, the Govt thro oil companies can think of providing this portable digital / analog Pascal meter costing just Rs.6000/- to each petrol bunk to measure running Air intake filter Differential.

4. so that when the vehicle driver fills up petrol, he can also know his air intake filter choking condition, either the filter is clean, 33%, 67% and 100 % choked and take timely correction suitably.

5. Any automobile OEM to give the statistics to the buyer generically, as how much KMPL percentage drop on choking of air intake filter for Minimum pressure drop, for 50 % of rated Max pressure drop and for Max Pressure drop.

6. Present condition is that even the vehicle OEMs' service center does not measure and record this Pressure drop across vehicle air intake that comes for regular or routine service.

7. This vehicle records to include air filter pressure drop in Pascals for the vehicles under service. The service center to educate the customer to clean routinely, or replace the filter, if choked fully.

8. Also tell the customer what was pressure drop before service and after cleaning, how much pressure drop reduced after service?

9. PCRA is listing the fuel loss due to choked air intake filters in vehicles. But here, what we are more interested now, to correct is that, a choked vehicle air intake filter sucks other vehicle's exhausted air and that too in the idling condition at road signals.
10. All the three factors is now causing the vehicle to pollute much more, and each vehicle is crossing its limit of pollution beyond the threshold values very shortly since it already sucks bad air.
11. In the petrol bunk, provide compressed air cleaning for the vehicles' air intake filter from inside to outside direction in the filter chamber to clear the particulate dust depositing on the filter outer surfaces. (This is done in consultation with vehicle OEMs)
12. For this, the vehicle OEM to give provision to clean the same in vehicle OFF condition in the petrol bunk service centers. For this vehicle OEMs to provide easy approach to the air filter for 2, 3 and 4 wheelers & possibility of routine cleaning & monitoring.

CONCLUSION:-

Generically, the above retrofits, relocation, condition monitoring exercises to any vehicle mainly the 4 wheelers, 3 wheelers and in parallel deploy the same to 2 wheelers; will definitely yield direct and indirect benefits in the longer run. The benefits are:-

1. Fuel saving in vehicles.
2. Smooth pickup & running due to relatively clean air intake filter
3. Less pollution from vehicle to other users, surrounding us.
4. Vehicle's engine health sustains for longer period in its life time.

Please look into the low cost instant implementable Suggestion from Ashok S, BEE Accredited Energy Auditor, Coimbatore.
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